AMENDMENT TO THE CLAIMS

1.(currently amended) A head for a magnetic drive, comprising:

a substrate with a thermal expansion rate CTE1;

a transducer that has a bond to the substrate and that has a transducer thermal expansion rate CTE2 that is greater than CTE1 such that the transducer is subject to thermal protrusion with increasing temperature, the transducer having two opposite sides; and

a first restraint layer that has a bond to a first one of the sides of the transducer and that has a first restraint layer thermal expansion rate CTE3 that is less than CTE1, the first restraint layer having ~~a combination of a Young's Modulus, a Poisson's ratio and~~ a thickness of at least 2 μm such that the thermal protrusion is reduced by a factor of three or more ~~the first restraint layer pulls the transducer back away from magnetic media to avoid contact with magnetic media at high head temperatures~~.

2. (original) The head of Claim 1 wherein the transducer and the first restraint layer are bonded together to have a combined expansion rate that is substantially matched with CTE1.

3. (original) The head of Claim 1, wherein the first restraint layer has dimensions and material properties that are selected to limit protrusion of the transducer beyond the substrate over an operating temperature range.

4. (original) The head of Claim 1, further comprising:

a second restraint layer that has a bond to a second one of the sides of the transducer, and that has an second restraint layer thermal expansion rate CTE4 that is

less than CTE1.

5. (original) The head of Claim 4 wherein the transducer and the first and second restraint layers are bonded together to have a combined expansion rate that is substantially matched with CTE1.

6. (original) The head of Claim 5, further comprising a third layer that has a bond to the second restraint layer.

7. (original) The head of Claim 6, further comprising a bonding film between the second restraint layer and the third layer.

8. (original) The head of Claim 1 wherein the first restraint layer has a restraint layer width that is substantially the width of the transducer.

9. (original) The head of Claim 1 wherein the first restraint layer has a restraint layer width that is substantially the width of the substrate.

10. (original) The head of Claim 1 wherein the substrate comprises ceramic material with a thermal expansion rate in the range of about 7×10^{-6} /°C. to 8.3×10^{-6} /°C.

11. (original) The head of Claim 10 wherein the transducer comprises metals with thermal expansion rates in the range of 12×10^{-6} /°C to 17×10^{-6} /°C.

12. (original) The head of Claim 11 wherein the first restraint layer comprises material with a thermal expansion rate of about 1×10^{-6} /°C to 4.3×10^{-6} /°C selected from the group: aluminum nitride, silicon nitride and silicon dioxide.

13. (currently amended) A method of manufacturing a head for a magnetic drive, comprising:

A. providing a substrate with a thermal expansion rate CTE1;

B. bonding a transducer with a thermal expansion rate CTE2 greater than CTE1 to the substrate such that the transducer is subject to thermal protrusion with increasing temperature, the transducer having two opposite sides;

C. bonding a first restraint layer to a first one of the sides of the transducer, the first restraint layer having a thermal expansion rate CTE3 less than CTE1; and

D. effectively compensating for thermal expansion of the substrate and the transducer by setting ~~a combination of a Young's Modulus, a Poisson's ratio and~~ a thickness of the first restraint layer to at least 2 μm such that the thermal protrusion is reduced by a factor of three or more ~~the first restraint layer pulls the transducer back away from magnetic media to avoid contact with magnetic media at high head temperatures~~.

14. (original) The method of Claim 13 further comprising:

D. bonding the transducer and the first restraint layer together to have a combined expansion rate that is substantially matched with CTE1.

15. (original) The method of Claim 13 further comprising:

D. selecting dimensions and material properties for the first restraint layer to limit protrusion of the transducer beyond the substrate over an operating temperature range.

16. (original) The method of Claim 13, further comprising:

D. bonding a second restraint layer to a second one of the sides of the transducer, the second restraint layer having a thermal expansion rate CTE4 that is less than CTE1.

17. (original) The method of Claim 13 further comprising:

D. including a material in the first restraint layer selected from the group: aluminum nitride, Si_3N_4 and SiO_2.

18. (original) The method of Claim 13, further comprising:

D. forming the first restraint layer by thin film deposition.

19. (currently amended) A head for a magnetic drive, comprising:

a head assembly including a substrate and a magnetic transducer, the transducer being subject to thermal protrusion with increasing temperature; and

means for restraining thermal expansion of the magnetic transducer, wherein the means for restraining has ~~a combination of a Young's Modulus, a Poisson's ratio and~~ a thickness of at least 2 μm such that the thermal protrusion is reduced by a factor of three or more ~~the means for restraining pulls the transducer back away from magnetic media to avoid contact with magnetic media at high head temperatures~~.